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RKI Instruments, Inc.  
San Diego Miramar College  
Schatz Energy Research Center  
Siemens Westinghouse Power Corp.  
So. Coast Air Quality Mgmt District  
Spencer Management Associates  
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SunLine Transit Agency  
Teledyne Energy  
TIAX LLC  
Toyota Motor Sales USA, Inc.  
UC, Berkeley - CIDER  
UC, Davis ITS  
UC, Energy & Resources Group  
UC, Berkeley - Lawrence  
UC, Irvine Natl F. C. Research Center  
US Fuel Cell Council  
UTC Fuel Cells  
Valley Environmental Associates  
Ztek Corporation

# Air Products and Chemicals, Inc.

7201 Hamilton Boulevard  
Allentown, PA 18195-1501



[www.airproducts.com/h2energy](http://www.airproducts.com/h2energy)

**Products:** Air Products and Chemicals, Inc. supplies hydrogen fuel and fueling equipment including integrated solutions for the hydrogen infrastructure. We also provide safety training and services.

**Description:** Air Products and Chemicals, Inc., is the world's largest supplier of merchant hydrogen. A commercial developer, supplier and operator of turnkey hydrogen on-site plants, Air Products is in the forefront of developing hydrogen fueling stations for clean transportation applications and the technologies and systems for hydrogen purification, generation and handling. A participant in numerous hydrogen energy demonstration projects in the U.S. and Europe, Air Products is working to bring low-cost distributed hydrogen production technologies to the marketplace to promote the development of hydrogen energy applications.

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# Altergy Systems

2330 Gold Meadow Way  
Gold River, CA 95670

[www.altergysystems.com](http://www.altergysystems.com)



**Products:** Altergy Systems® develops and manufactures advanced, low cost, proprietary Proton Exchange Membrane (PEM) fuel cells, the stationary *Freedom Power System™ (FPS)* and the portable *Freedom Power Pack™ (FPP)*.

**Description:** Altergy's *Freedom Power* products provide freedom from the grid, freedom from foreign oil, freedom from traditional energy solutions, freedom from batteries and freedom from pollution. *Freedom Power* products have many applications and range in size from 50 watts to 100 kilowatts.

**Advantages:** Altergy's patent pending technology breaks critical fuel cell barriers:

- Cost – critical component cost reduced by more than 80% over competitor designs.
- Manufacturability – products designed from the onset to be built in high volume and at low cost, using established processes and equipment.
- Scalability – limited only by available material size.
- Modularity – sealing, contact, cooling, reactant management and testing is independent of stack assembly.
- Robust – conducive to harsh environments

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**American Honda  
Motor Co., Inc.**

**1919 West Torrance Blvd.  
Torrance, CA 90501**

**HONDA**

**[www.honda.com](http://www.honda.com)**

**Products:** Hydrogen Fuel cell vehicles, solar-power hydrogen refueling stations, natural gas reformer hydrogen refueling stations

**Description:** Honda is involved in the research, development and manufacturing of hydrogen fuel cell vehicles and hydrogen production stations. Products include the Honda FCX fuel cell vehicle, which is the world's first EPA-certified fuel cell car, and experimental hydrogen production stations that utilize either solar power or natural gas resources.

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# Anuvu Incorporated

3980 Research Drive  
Sacramento, CA 95838

[www.anuvu.com](http://www.anuvu.com)



**Products:** Anuvu, Incorporated is a fuel cell company that manufactures industrial Proton Exchange Membrane (PEM) fuel cells, designs fuel cell and fuel cell hybrid engines, and provides custom zero emission energy solutions for a wide variety of strategic partners. The Anuvu fuel cell is designed to replace internal combustion engines in transportation and power generation applications.

The Anuvu Power-X fuel cell stack is a high performance, mass-producible fuel cell that enables near term deployment of zero emission fuel cell vehicles and boats in transportation markets. The company has been manufacturing fuel cells since 1993.

Anuvu has created a new class of vehicle, the Clean Urban Vehicle (CUV), to cost-effectively merge the efficiency and environmental benefits of hydrogen fuel cells with today's safety, comfort, and styling at a more approachable price. The Anuvu CUV utilizes a battery/fuel cell hybrid power source to provide an electric car with exceptional performance and range.

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# Asia Pacific Fuel Cell Technologies, Ltd.

3812 E. La Palma Ave.  
Anaheim, CA 92807

[www.apfct.com](http://www.apfct.com)



**Description:** Design and manufacture of PEM fuel cell stacks, systems and end applications.

- **STACKS AND HUMIDIFIERS**
  - Water cooled 1kw through 20kw
  - Air cooled 100w through 1kw
  - Internal and external water recuperation humidifiers
- **POWER SYSTEMS**
  - Complete direct fuel cell power system 100w through 5kw with electronic controller.
  - Fuel cell / NiMH battery hybrid system with smart charging and controller.
- **HYDROGEN STORAGE**
  - Metal hydride hydrogen storage system with quick disconnect
  - Metal hydride canister recharging system
- **END PRODUCTS**
  - Fuel cell scooters
  - Mobile power generator

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## **Ballard Power Systems Inc.**

**4343 North Fraser Way,  
Burnaby, BC, V5J 5J9 Canada**

# **BALLARD®**

**[www.ballard.com](http://www.ballard.com)**

**Products:** Proton Exchange Membrane (PEM) Fuel Cells and PEM Fuel Cell systems, electric drives for fuel cells and other electric vehicles, power conversion products, friction materials for power train components.

**Description:** Ballard Power Systems is recognized as the world leader in developing, manufacturing and marketing zero-emission proton exchange membrane (PEM) fuel cells for use in transportation, portable and stationary applications.

Ballard is also commercializing electric drives for fuel cell and other electric vehicles, power conversion products, and is a Tier 1 automotive supplier of friction materials for power train components.

Ballard is partnered with strong, world-leading companies, including DaimlerChrysler, Ford, EBARA, ALSTOM and FirstEnergy, to commercialize Ballard® fuel cells. Ballard has supplied fuel cells to Honda, Mitsubishi, Nissan and Volkswagen, among others.

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# BMW of North America, LLC

1 BMW Plaza,  
Montvale, NJ 07645

[www.bmwgroup.com](http://www.bmwgroup.com)



**Products:** International automobile manufacturer.

The BMW 750hL, a production ready car, is the culmination of three decades of research on hydrogen powered vehicles. The 750hL is a car powered by sunlight and water. BMW's Clean Energy system involves liquid hydrogen produced from water using photovoltaic power.

Hydrogen as a motor fuel is the answer to many environmental problems since there are no harmful emissions, no depleting of resources and no danger to the atmosphere. The heart of the 750hL is a hybrid, 12-cylinder internal combustion engine with two independent electronically controlled fuel injection systems. These systems allow the 750hL to run on either gasoline or hydrogen.

## **Description:**

Design, manufacture and distribution of premium brand automobiles.

**Contact:**

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# The BOC Group

575 Mountain Avenue  
Murray Hill, NJ 07974



[www.boc.com](http://www.boc.com)

**Products:** BOC is a leading supplier of industrial gases and related products and services throughout the world.

**Description:** BOC supplies hydrogen via every available mode of distribution, including as cryogenic liquid via tankers and as compressed gas via pipelines, tube trailers, and cylinders. BOC has decades of experience with the application and development of various hydrogen production technologies, including large-scale steam/methane reforming, partial oxidation, methanol reforming, by-product hydrogen production, and small-scale electrolysis. BOC operates over 100 hydrogen generation systems throughout the world.

BOC is a leader in the safe handling, production, and distribution of high-pressure hydrogen. Our proven designs and experience demonstrate our commitment to safe and reliable delivery systems, as does the craftsmanship exhibited during construction. The stringent and exacting specifications BOC has used to install facilities like these in locations such as nuclear power plants, chemical plants, and steel mills are translated to supplying infrastructure to the growing hydrogen refueling market.

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# California Fuel Cell Partnership

3300 Industrial Blvd., #1000  
West Sacramento, CA 95691



[www.cafcp.org](http://www.cafcp.org) or [www.fuelcellpartnership.org](http://www.fuelcellpartnership.org)

**Products:** Hydrogen, fuel cells, and fuel cell vehicle fact sheets; Fuel Cell Vehicle Emergency Response (ER) Guide; Bus Demonstration/Data Sharing Guide; Vehicle/Fueling Interface Document (Rev. 6.0); CaFCP Teacher's Kit; Fuel Scenarios Study (2001)

The California Fuel Cell Partnership is a path breaking collaboration of auto companies, fuel providers, fuel cell technology companies and government agencies that is placing fuel cell electric vehicles and fueling infrastructure in California.

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# California Stationary Fuel Cell Collaborative

1001 'T' Street, 25th Floor  
Sacramento, CA 95812

[www.stationaryfuelcells.org](http://www.stationaryfuelcells.org)



**Products:** The California Stationary Fuel Cell Collaborative (CaSFCC) exists to facilitate commercialization and deployment of fuel cells into California's energy infrastructure.

**Description:** The Collaborative engages in several activities related to facilitating the commercialization of stationary fuel cells in California, including:

- Developing recommendations for policies/programs that support the Collaborative's goals of cost-effective, clean, reliable, and diverse sources of energy
- Working with industry, government and other stakeholders to identify opportunities for siting fuel cells that yield mutually beneficial results
- Encouraging the improved performance and cost reduction of fuel cell products - including the support of hybrid technologies as a cost effective system to achieve a diverse energy supply
- Identifying financing and incentive opportunities for stationary fuel cell installations
- Implementing an inter-organizational policy to utilize fuel cells in government facilities
- Working with public entities to encourage the establishment of competitive bulk procurement agreements
- Working with regulatory agencies to identify and address regulatory barriers
- Encouraging outreach and education
- Developing state procurement instruments that encourage the placement of clean distributed generation in state buildings
- Supporting demonstration projects for evaluation of technical and environmental benefits
- Collecting, evaluating and distributing data on the commercialization of stationary fuel cells in California
- Investigating new technology initiatives that would integrate mobile and stationary fuel cells efforts

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# Caterpillar Inc.

100 NE Adams Street  
Peoria, IL 61602

[www.Cat.com](http://www.Cat.com)

**Products:** Distributor of FuelCell Energy, Inc. molten carbonate Direct Fuel Cell power plants ranging from 250 to 3MW electrical output. For more than 75 years, Caterpillar Inc. has been building the world's infrastructure and, in partnership with Cat dealers, is driving positive and sustainable change on every continent. Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines and industrial gas turbines. The company is a technology leader in construction, transportation, mining, forestry, energy, logistics, financing and electric power generation.

**Description:** Direct FuelCells® generate electricity with no combustion; they are, in effect, like large continuously operating batteries that generate electricity as long as fuel, such as natural gas, is supplied. The fuel is not burned, there are virtually no emissions, and, because DFC power plants are designed to generate hydrogen internally, they are commercially available today without waiting for the development of a hydrogen supply infrastructure. FuelCell Energy, Inc. ([www.fuelcellenergy.com](http://www.fuelcellenergy.com)), based in Danbury, Connecticut, is a world-recognized leader for development and commercialization of high efficiency fuel cells for electric power generation.

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# Chevron Energy Solutions

345 California Street, 32nd Floor  
San Francisco, CA 94104



[www.chevronenergy.com](http://www.chevronenergy.com)

**Products:** Chevron Energy Solutions (CES) is a service company that offers integrated energy solutions, including distributed generation systems and energy efficiency solutions, to institutions and businesses nationwide. Our experience includes the design, development and project management of fuel cell, microturbine and other new self-generation and cogeneration systems. CES installed the first commercial fuel cell power plant in the San Francisco Bay Area, at ChevronTexaco's world headquarters in San Ramon. ChevronTexaco also installed a fuel cell plant at its Bellaire, Texas facility. Chevron Energy Solutions' professionals have the knowledge and experience to provide the highest quality and most cost effective integrated fuel cell power generation systems for a variety of applications.

**Description:** The ChevronTexaco fuel cell installation in San Ramon provides high-quality, reliable power to an operation-critical data center for ChevronTexaco. The system is designed to ensure continuous power to the facility in the event of a disturbance on the local distribution line. In addition, the waste heat from the fuel cell is used to displace natural gas used for building heat, dehumidification and domestic hot water. The fuel cell's quiet operation and extremely low emissions also have made it an excellent choice for a corporate campus environment.

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# **DaimlerChrysler RTNA, Inc.**

**3300 Industrial Blvd., Suite 800  
West Sacramento, CA 95691**

DAIMLERCHRYSLER

**[www.daimlerchrysler.com](http://www.daimlerchrysler.com)**

**Products:** Fuel cell vehicles

**Description:** DaimlerChrysler, RTNA is a testing ground for the advancement of fuel cell technology and is one of the founding members of the California Fuel Cell Partnership. At the Partnership headquarters in West Sacramento, DaimlerChrysler tests its latest fuel cell vehicle prototypes under real-world driving conditions, engages in public outreach events and supports vehicle development.

Since introducing the first fuel cell vehicle in 1994, pioneer DaimlerChrysler has decisively advanced fuel cell technology and presented 20 concept vehicles, thus demonstrating the technical feasibility of this groundbreaking propulsion principle employing the “fuel cell”. With the Mercedes-Benz A-Class “F-Cell”, the first cars to grow out of the research stage go on the road by the end of 2003. They are being manufactured under near-standard conditions and will be operated and tested by customers in everyday use within the framework of international cooperative ventures. Also by the end of 2003, the first fuel cell fleet of thirty Mercedes-Benz Citaro buses will be in full operation in major European cities.

2004 will see the start of the first collaborative venture with customers in North America when DaimlerChrysler, the Environmental Protection Agency, and the United Parcel Service team up to put several fuel cell delivery vehicles into commercial service in Michigan. This effort follows in the footsteps of a similar cooperation launched in Germany in 2001 with the Hamburg-based delivery company “Hermes”.

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# Dana Corporation

2910 Waterview Dr.  
Rochester Hills, MI 48309



[www.dana.com](http://www.dana.com)

**Products:** Components supplier -

Dana Corporation has established five (5) global Fuel Cell Support Centers (FCSC) to help the fuel cell industry merge as a mainstream technology. The centers are strategically located in Germany, United Kingdom, Canada, United States, and Japan. The Dana Corp are leaders in the area of thermal management, composite and metallic bipolar plates with integrated seals, and key balance of plant products including electronic pumps/valves and fluid routing. They focus our efforts in support of PEM and SOFC markets - for small stationary, automotive, portable, and auxiliary power units. Key objectives for Dana's fuel cell efforts focus around meeting and exceeding customer requirements. Dana was awarded the GM Supplier of the Year award in 2002 for its efforts in fuel cell stack and seal development.

**Description:** Dana Corporation is a global leader in the design, engineering, and manufacture of value - added products and systems for automotive, commercial, and off-highway vehicle manufacturers and their related aftermarkets. Dana employs approximately 60,000 people worldwide. Founded in 1904 and based in Toledo, Ohio, Dana operates hundreds of technology, manufacturing, and customer service facilities in 30 countries. Dana reported 2002 sales of \$9.5 billion.

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# **Dynetek Industries Ltd.**

**4410 - 46 Avenue SE  
Calgary, AB T2B 3N7  
CANADA**

**[www.dynetek.com](http://www.dynetek.com)**

**Description:** Dynetek Industries Ltd. designs, produces and markets one of the lightest and most advanced fuel storage and refueling systems for many compressed gases. Dynetek has extensive knowledge in composite cylinder and systems design and is recognized around the world as the solution-of-choice to the alternate fuel vehicle sector. Dynetek products are used in automotive applications as well as bus and heavy-duty trucks. Dynetek also serves the industrial gas and energy sectors in the bulk transport and storage of compressed gases.

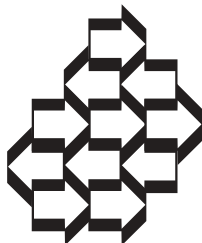
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# Electric Vehicle Information Services (EVINFO)

P.O. Box 6025  
Moraga, CA 94556

[www.evinfo.com](http://www.evinfo.com)



**Products:** Electric Vehicle Information Services (EVINFO) is a specialized consulting organization focused on providing information products and services to the emerging global fuel cell community. To reflect its new orientation the company is in the process of formally changing its business name to FUELCELLINFO.INFO. Services offered include: business information, corporate development, strategic intelligence and international technology transfer. EVINFO's clientele includes both public and private sector organizations, i.e. major corporations, small businesses and governmental agencies. EVINFO's affiliate, Business/Technology Books, is a leading publisher of technical information. A wide variety of publications are offered with special emphasis on fuel cell and hydrogen technologies. Other related technical areas include hybrid electric vehicles, EVs, batteries, ultracapacitors and flywheels.

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# Emergent Energy Group

P.O. Box 6936

Moraga, CA 94570

[www.EmergentEnergy.net](http://www.EmergentEnergy.net)



**Products and Description:** Emergent Energy Group Inc. (EEG), is a fuel cell power plant system integrator and offers to provide the full spectrum integration from turnkey installation/operation or equipment only. The qualifications of the key individuals on the EEG team are considerable, and span all required aspects. EEG and the California Power Authority (CPA) agree on the assessment of FCE's fuel cell power plants stating:

“On behalf of CPA, the Department of General Services (DGS) analyzed the pricing information from the RFB (Request for Bids) submittals to estimate the average cost of fuel cell energy. This is compared against the current average retail cost of energy of 12-16.5 cents/kWh today for State facilities located in investor-owned utility check areas. This analysis suggests that “Molten Carbonate Fuel Cell technology appears to be near cost-competitive now (at 13 cents per kWh in 2003), before taking into consideration possible capital “buy-downs.” (California Power Authority Request for Bids Award, Feb. 25, 2002).

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# **EPRI**

**3412 Hillview Ave.  
Palo Alto, CA 94304-1395**

**www.epri.com**

**Products:** EPRI conducts research and development on fuel cell technology, applications, demonstrations and market analysis. EPRI has been involved with all aspects of fuel cell R&D and commercialization for the past 25 years. EPRI is currently focusing on high temperature fuel cell R&D for stationary distributed power markets. The EPRI program also supports fuel cell manufacturers in helping catalyze commercialization via initiating demonstrations; developing of collaboratives and public private partnerships to advance the commercialization of new products into the electricity enterprise. Recently EPRI has also been conducting research on the hydrogen/electric infrastructure to better support National Policy and to engage electric power generation and distribution companies in helping shape a future hydrogen / electric economy.

**Description:** EPRI products and services include:

- Technical project management
- Research Reports on fuel cell technology and economic assessment
- Test Reports from fuel cell field demonstrations
- Design and application guidelines for fuel cells
- Electrical Interconnection tools
- Market Analysis and business case analysis for fuel cells

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# Ford Motor Company

3300 Industrial Blvd., Suite 700  
West Sacramento, CA 95691



[www.ford.com](http://www.ford.com)

**Products:** Fuel cell vehicles

**Description:** Ford Motor Company is aggressively pursuing and implementing advancements that reduce the emissions impact of vehicles on the environment. Sustainable Mobility Technologies is dedicated to engineering fuel cell vehicles that produce zero tailpipe emissions and may eventually replace conventional vehicles.

The Ford Focus FCV brings the latest in fuel cell technology to life. Its innovative powertrain combines a Ni-MH high-voltage battery with a hydrogen-powered fuel cell engine to help increase performance and efficiency while still providing zero emissions. This is done with no compromises to the customer looking for traditional comfort and feel from the world's best selling compact car. Limited fleet sales of Ford's latest-generation fuel cell vehicle are scheduled to begin in 2004.

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## **Fuel Cell Energy, Inc.**

**225 South Lake Avenue, Suite 300  
Pasadena, CA 91101**



**FuelCell Energy**

**[www.fuelcellenergy.com](http://www.fuelcellenergy.com)**

**Products:** Fuel cell manufacturer.

**Description:** Fuel Cell Energy Inc. manufactures large stationary power plants: the DFC®300 at 250kW, the DFC® 1500 at 1MW and the DFC® 3000 at 2MW. Our patented Direct Fuel Cell® technology delivers reliable power efficiently, simply and economically. These qualities, combined with ultra-low emissions and quiet operation, provide all the elements necessary to make distributed power generation the best choice-right now - for large commercial and industrial facilities, institutions, municipalities and utilities.

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## Fuel Cells 2000

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Washington, DC 20006

[www.fuelcells.org](http://www.fuelcells.org)



**Description:** Category – Research Fuel Cells 2000 is an independent, continuing program to educate policy makers, the press and the general public about the potential benefits of fuel cells and hydrogen. It is the leading nonaligned source of information about fuel cells. Our web site: offers users a comprehensive source of information about fuel cells and their applications and was selected one of the Top 50 science and technology sites by *Popular Science* Magazine. Other Fuel Cells 2000 programs include an online Career Center, the Fuel Cell Match Maker message board, the Fuel Cell Technology Update (free monthly newsletter with a circulation of 13,000), the Fuel Cell Quarterly newsletter, the Fuel Cell Directory, and comprehensive product and comparison charts.

**Contact:** Jennifer Gangi  
**Phone:** (202) 785-4222, ext. 17  
**Fax:** (202) 785-4313  
**E-mail:** [jennifer@fuelcells.org](mailto:jennifer@fuelcells.org)

# Gas Technology Institute

Street address: 1700 S. Mt. Prospect Rd.  
Des Plaines, IL 60018

[www.gastechnology.org](http://www.gastechnology.org)

**Products:** Fuel cell - membranes, plates – both PEM and solid oxide, hydrogen reformers, hydrogen fueling station packages, hydrogen technology development and deployment project management service.

**Description:** GTI is dedicated to meeting the nation's current and future energy needs and environmental challenges by developing solutions for consumers, industry, and government.

GT is an independent not-for-profit R&D organization

- 18-acre campus
- 350,000 ft<sup>2</sup> facility
- Labs, test facilities, library, classrooms, offices
- Performs contract research, development and demonstration projects (field and laboratory)
- Provides technical services in areas related to energy and the environment
- Commercializes new energy-related technology, directly and through subsidiaries
- Plans and manages technology development programs for the gas industry and other clients
- Provides education and training on technical and business topics related to energy and natural gas

<b>Contact:</b>	<b>Gerry Runte</b> <b>Executive Director</b> <b>Hydrogen Systems,</b> <b>Gas Technology Institute</b>
<b>Phone:</b>	<b>(847) 768-0730</b>
<b>Fax:</b>	<b>(847) 768-0501</b>
<b>E-mail:</b>	<b><a href="mailto:gerry.runte@gastechnology.org">gerry.runte@gastechnology.org</a></b>

# General Atomics

3550 General Atomics Court  
San Diego, CA  
92121-1122



[www.ga.com](http://www.ga.com)

**Products:** Developer of systems to produce hydrogen using hydrothermal processing.

**Description:** General Atomics is developing Supercritical Water Partial Oxidation (SWPO) for the efficient and environmentally advantageous gasification and hydrogen production.

SWPO involves carrying out oxidative reactions in a hydrothermal environment – akin to high-pressure steam— in the presence of limited quantities of oxidant, typically pure oxygen or air. Partial oxidation in-situ rapidly heats the gasification medium, resulting in less char formation and improved hydrogen yield. The high-pressure, high-density aqueous environment is ideal for reacting and gasifying organics. The high water content of the medium is compatible with high water content feeds such as sludges and biomass and eliminates the need for feedstock drying. The high water content of the medium is also effective for gasification of hydrogen-poor materials such as coal.

The economics for 40 tpd sewage sludge plants augmented with grease trap waste are favorable over a significant range of cost parameters such as sludge revenue and capital financing. Hydrogen production costs for SWPO plants of this size are projected to be about \$3/GJ (~\$0.35/kg) or less.

<b>Contact:</b>	<b>Mike Spritzer</b>
<b>Phone:</b>	<b>(858)455-2337</b>
<b>Fax:</b>	<b>(858)455-4111</b>
<b>E-mail:</b>	<b>michael.spritzer@gat.com</b>



# General Motors Corporation

Global Headquarters  
300 Renaissance Center  
Detroit, MI 48265-3000



[www.gm.com](http://www.gm.com)  
[www.gmability.com](http://www.gmability.com)

**Description:** GM has extensive hydrogen fuel cell research and development facilities in both the U.S. and Europe. This includes a facility in Torrance, California. GM has produced the Hy-wire concept vehicle, the world's first drivable vehicle that combines a hydrogen fuel cell with by-wire technology. The propulsion system is contained in an 11-inch thick skateboard-like chassis. By-wire controls attached to the chassis through a single docking port use electrical signals instead of mechanical links or hydraulics to control steering, acceleration and braking. This concept provides unprecedented design freedom. GM has also produced the Hydrogen3 minivan which is operating in various test fleets, and the world's first hydrogen fuel cell vehicle with an on-board gasoline reformer. The fuel cell technology that GM is developing for automobiles is also being placed in stationary distributed generation applications. This provides a valuable way to gain real world operating experience in the near-term, and is a logical step toward making fuel cells commercially viable in automobiles.

**Contact:**            **Dave Barthmuss (Media Relations), Manager,**  
                             **California Environment and Energy Issues**  
                             **Robert Babik, Director, Vehicle Emissions Issues**

**Phone:**            **Dave Barthmuss            (805) 373-9572**  
                             **Robert Babik                (313) 665-3092**

**Fax:**                **Dave Barthmuss            (805) 373-9648**  
                             **Robert Babik                (313) 665-0746**

**E-mail:**            **dave.barthmuss@gm.com**  
                             **robert.babik@gm.com**

# **Harvest Energy Technology, Inc.**

**9253 Glenoaks Blvd.**

**Sun Valley, CA 91352**

**[www.harvest-technology.com](http://www.harvest-technology.com)**

**Products:** Natural Gas and LPG fuel processors in the 1-200 kW size range for stationary power applications. Packaged hydrogen generators in the 50-200 kW size range (1300-5200 scfh H<sub>2</sub> product) for stationary power, hydrogen refueling and industrial applications. Catalytic oxidation systems for removal of carbon monoxide from reformat gas streams.

<b>Contact:</b>	<b>David Warren</b>
<b>Phone:</b>	<b>(818) 767-3157</b>
<b>Fax:</b>	<b>(818) 767-0246</b>
<b>E-mail:</b>	<b><a href="mailto:dwarren@harvest-technology.com">dwarren@harvest-technology.com</a></b>

# Holt of California

3850 Channel Dr

West Sacramento, CA 95691



[www.Holtca.com](http://www.Holtca.com)

**Products:** Caterpillar Dealer supplying Power Systems to North Central California. Sales, Service, and engineering support for Caterpillar/DFC fuel cells, 250kW and larger, as well as gensets, UPS systems, and switchgear.

**Contact:**            **Richard Lund**  
                             **Sales Manager**  
                             **Power Systems Group**  
**Phone:**            **(916) 373-4147**  
**Fax:**                **(916) 373-4146**  
**E-mail:**            **rlund@holtca.com**

# Hydrogen Ventures LLC

400 Continental Boulevard  
El Segundo, CA 90245



[www.hydrogen.la](http://www.hydrogen.la)

**Products:** We assist in building world-class companies that are developing products for a cleaner environment and reduced reliance on fossil energy resources. Our product focus includes advanced transportation technologies, distributed power generation, advanced energy storage, enabling technologies, renewable energy, clean fuels, fuel cells and hydrogen. We offer services in program planning & management, business development, technical evaluation and attracting capital.

**Description:** Management Consulting and Financial Services

<b>Contact:</b>	<b>Jerald Cole, Chief Technology Officer</b> <b>Elias Azrak, Managing Partner</b>
<b>Phone:</b>	<b>(310) 426.2628</b>
<b>Fax:</b>	<b>(310) 426.2001</b>
<b>E-mail:</b>	<b>info@hydrogen.la</b>

# Hydrogenics Corporation

## Headquarters:

5985 McLaughlin Road

Mississauga, Ontario

Canada L5R 1B8



## California address:

27385 Parklane Way

Valencia, CA 91354

[www.hydrogenics.com](http://www.hydrogenics.com)

**Products:** Fuel Cell Power Modules, Fuel Cell Power Systems, Electrolyzer Modules, Hydrogen Generation Systems, Electrolyzer Refuelers, Reformer Refuelers, System Integration Services, Fuel Cell Test Equipment (through Greenlight Power Technologies subsidiary), Fuel Cell Testing Services (through Greenlight Power Technologies subsidiary)

**Description:** Hydrogenics Corporation is a leading clean power generation company, engaged in the commercialization of fuel cell technology. The company is building a sustainable business in a potentially “game changing technology” for transportation, stationary and portable power. The Hydrogenics team is driven by the vision of a dramatically different future in which sustainable, reliable and efficient power technology contributes to a healthier environment and better global quality of life. Hydrogenics, based in Mississauga, Ontario, Canada, has operations in British Columbia (Canada), Japan, the United States and Germany.

## Contact:

**Kevin Harris**

## Phone:

**(661) 253-2593**

## Fax:

**(905) 361-3626**

## E-mail:

**kharris@hydrogenics.com**

# HyGen Industries, L.L.C.

P.O. Box 955

Topanga, CA 90290

[www.hygen.com](http://www.hygen.com)

**Products:** Renewable Infrastructure Systems Integration & Installation, PEM Electrolysis Systems, Project Development & Management, and Hydrogen ICE Vehicle Development and Deployment.

**Description:** HyGen Industries (“HyGen”), a California Limited Liability Company, is organized to develop and deploy hydrogen projects to meet the increasing demand for cost effective, clean, sustainable, renewable energy and transportation fuel. HyGen’s expertise includes project management and development, hydrogen Internal Combustion Engine (ICE) vehicle conversions, as well as hydrogen fueling and production systems, systems integration and installations and safety analysis. HyGen also markets the systems that produce, dispense and distribute renewable/sustainable hydrogen. HyGen is proposing to offer a “one-stop shop” for renewable and sustainable hydrogen energy generating and fueling systems as well as end-use conversion technologies for vehicles and energy systems. HyGen has over 25 years of experience in these areas.

**Contact:** Paul Staples, Chairman/CEO

**Phone:** (310) 455-2005

**Fax:** (310) 472-8643

**E-mail:** [h24@hygen.com](mailto:h24@hygen.com)

**Contact:** James Provenzano, Executive Vice President

**Phone:** (310) 472-8633

**E-mail:** [jjpro@hygen.com](mailto:jjpro@hygen.com)

# H<sub>2</sub> ECO<sup>2</sup>nom<sup>y</sup>

220 S. Kenwood St., Suite 305  
Glendale, CA 91205-1671



[www.h2economy.com](http://www.h2economy.com)

**Products:** Fuel cell manufacturer, components, research.

1. PEM Fuel Cell System for UPS/Backup power: (a) 1kW air cooled, (b) 5kW water cooled, and (c) with electrolyzer (all under development),

2. PEM Fuel Cell Stacks 1-100W for education, demo and research: CuteFC™, CozyFC™ and CoolFC™ series (available for sale).

3. Other fuel-cell related products: Low input voltage DC-DC converters, fuel cell test stations (available for sale) .

## **Description:**

(a) Modular 1kW air-cooled units to backup the power to IT or telecom industries smaller devices. The units can be stacked for applications requiring more capacity.

(b) 5kW water cooled systems will provide access to a broad range of applications beyond those served by our 1kW units, including residential and commercial buildings, small industrial facilities and many more.

(c) Electrolyzer will recharge the hydrogen storage of our fuel cells whenever power is available. Efficient energy storage for electricity provided by the grid, wind turbines, PV, or any other intermittent off-grid power generators.

<b>Contact:</b>	<b>Serge Adamian</b> <b>CEO</b>
<b>Phone:</b>	<b>1 (818) 240-4500</b>
<b>Fax:</b>	<b>1 (818) 240-4501</b>
<b>E-mail:</b>	<b><a href="mailto:info@h2economy.com">info@h2economy.com</a></b>

# Los Angeles Department of Water and Power

111 North Hope Street  
Los Angeles, CA 90051



LOS ANGELES  
DEPARTMENT OF  
WATER & POWER

[www.ladwp.com](http://www.ladwp.com)

**Products:** Provider of Electric and Water Utility Services to the City of Los Angeles.

**Description:** LADWP has demonstrated strong commitment for Distributed Generation (DG). Five large stationary fuel cell plants have been installed and operated, including the first commercial design high temperature fuel cell in North America.

**Contact:** Mr. William W. Glauz, P.E.  
DG Program Manager  
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**Fax:** (213) 367-0777  
**E-mail:** [william.glauz@ladwp.com](mailto:william.glauz@ladwp.com)

**Contact:** Mr. Kjell A. Ostensen, P.E.  
Fuel Cell Program Manager  
**Phone:** (213) 367-0011  
**Fax:** (213) 367-0777  
**E-mail:** [kjell.ostensen@ladwp.com](mailto:kjell.ostensen@ladwp.com)



## Luxfer Gas Cylinders

3016 Kansas Avenue  
Riverside, CA 91786

[www.luxfercylinders.com](http://www.luxfercylinders.com)



**Products:** Luxfer has a wide range of high pressure aluminum and composite cylinders suitable for storage of hydrogen, either as a compressed gas or within metal hydrides. The company has cylinders of sizes suitable for man portable fuel cell applications up to large cylinders suitable for fuel storage on fuel cell vehicles. Worldwide sales exceed three million aluminum cylinders and 350,000 composite cylinders per year.

**Description:** Luxfer makes lightweight high-pressure aluminum cylinders (Type 1), hoop wrapped aluminium cylinders (Type 2) and carbon composite cylinders (Type 3) to all internationally recognized standards. These products can be produced to the latest hydrogen storage standards such as EIHP2, NGV2 and ISO.

<b>Contact:</b>	<b>Mark Trudgeon</b>
	<b>Business Development</b>
<b>Phone:</b>	<b>(909) 341 2395</b>
<b>Fax:</b>	<b>(909) 781 6598</b>
<b>E-mail:</b>	<b><a href="mailto:mark.trudgeon@luxfer.net">mark.trudgeon@luxfer.net</a></b>

## **Metallic Power, Inc.**

2320 Camino Vida Roble  
Carlsbad, CA 92009



[www.metallicpower.com](http://www.metallicpower.com)

**Products:** Zinc regenerative fuel cells for backup power applications. Specialized in telecommunications backup power in the range of 1-20kW. Potential future applications include power for hand-held devices and auxiliary and motive power for electric vehicles.

**Description:** Metallic Power is the world's leading developer and manufacturer of zinc regenerative fuel cells. Regenerative fuel cells include an electrolyzer that regenerates the fuel from its reaction products using electricity from a primary source. The company was founded in 1995 and conducts research, development, and pilot manufacturing out of a 30,000 sf facility in Carlsbad, CA. Zinc fuel cells are similar to regenerative PEM hydrogen fuel cells except the fuel is 0.5mm diameter zinc particles immersed and transported in liquid electrolyte. This zinc fuel is nonflammable and abundant, and zinc fuel cells are relatively inexpensive, quiet, and emit no reaction products.

**Contact:** Jeffrey A. Colborn, Ph.D. Sr. VP –  
Marketing and Business Development  
**Phone:** (760) 476-8016  
**Fax:** (760) 476-8014  
**E-mail:** [jeff.colborn@metallicpower.com](mailto:jeff.colborn@metallicpower.com)

**Nissan**  
**North America, Inc.**

18501 South Figueroa Street  
Gardena, CA 90248-4500

**NISSAN**

[www.nissanusa.com](http://www.nissanusa.com)

**Products:** Fuel cell automobiles.

**Description:** Research of fuel cell technologies and their automotive applications.

<b>Contact:</b>	<b>Terri Hines</b>
<b>Phone:</b>	<b>(310) 771-5155</b>
<b>Fax:</b>	<b>(310) 516-7967</b>
<b>E-mail:</b>	<b><a href="mailto:terri.hines@nissan-usa.com">terri.hines@nissan-usa.com</a></b>

## **Plug Power Inc.**

**968 Albany Shaker Road  
Latham, New York 12110**



**[www.plugpower.com](http://www.plugpower.com)**

**Products:** Plug Power offers several proton exchange membrane (PEM) fuel cell product platforms to meet a wide variety of stationary power generation needs. These include GenSys™ Prime Power Systems and GenCore™ Premium Power Systems. The current product development platform stretches from 2 kilowatts to 25 kilowatts. GenSys™ combined heat and power fuel cell systems are designed to generate continuous, clean, efficient, and reliable power on-site. Operating in parallel with the grid, GenSys™ systems convert readily available fuels into electricity and heat for stationary residential and light commercial applications.

GenCore™ systems offer reduced operation and maintenance expenses, and reliable operation over a wide range of outdoor ambient conditions. Plug Power is one of a few fuel cell companies providing a comprehensive training and support program. Designed exclusively for customers, this two-week program is designed to teach users how to install, operate, and maintain Plug Power fuel cell systems.

**Description:** Plug Power Inc. designs, manufactures and markets proton exchange membrane (PEM) fuel cells for stationary applications. Plug Power's strategic partners include GE Fuel Cell Systems, DTE Energy Technologies, Vaillant GmbH, and Honda R&D Co., Ltd. The Company's headquarters are located in Latham, N.Y., with offices in Washington, D.C., and The Netherlands.

<b>Contact:</b>	<b>Cynthia Mahoney White</b> <b>Manager of Public Relations &amp; Marketing</b>
<b>Phone:</b>	<b>(518) 782-7700</b>
<b>Fax:</b>	<b>(518) 690-4445</b>
<b>E-mail:</b>	<b><a href="mailto:media@plugpower.com">media@plugpower.com</a></b>

# **Powerzinc Electric, Inc.**

**18623 E. Gale Avenue**

**City of Industry, CA 91748**

**[www.powerzinc.com](http://www.powerzinc.com)**

**Description:** Powerzinc Electric, Inc. is a California based company dedicated to the research, development and manufacturing of new, advanced environmental-friendly zinc-air fuel cell and zinc-air battery. Our key product - DQFC series zinc-air fuel cell is a high performance fuel cell that is specifically designed for electric vehicle applications. It is capable of powering an electric scooter for over 130 miles with a short, mechanical refuel time of less than 5 minutes. Our proprietary zinc-air fuel cell technology is also suitable for applications like consumer electronics, back-up power sources, telecommunications, medical devices, pleasure boats, etc.

**Business Type:** manufacturer and supplier of advanced zinc-air fuel cell and zinc-air battery.

**Product Types:** zinc-air fuel cell and zinc-air battery.

**Service Types:** Licensing and franchising zinc-air fuel cell manufacturing technologies and facilities.

**Telephone:** (626) 810-3068

**Fax:** (626) 810-7400

## **Praxair, Inc.**

**2300 E. Pacific Coast Highway  
Wilmington, CA 90744**



**www.praxair.com**

**Products/Description:** Praxair is the largest industrial gases company in North and South America, and one of the largest worldwide, with 2002 sales of \$5.1 billion. The company produces, sells and distributes atmospheric and process gases, and high-performance surface coatings. Praxair products, services and technologies bring productivity and environmental benefits to a wide variety of industries, including aerospace, chemicals, food and beverage, electronics, energy, healthcare, manufacturing, metals and others. Praxair is an Associate Member of the California Fuel Cell Partnership, and is developing hydrogen fueling station technology, and has plans to open a compressed gaseous hydrogen fueling station at Los Angeles International Airport and looks forward to other hydrogen fueling station projects both inside and outside California during the next several years.

**Contact:** Aaron Rachlin  
Wilmington, CA  
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**E-mail:** Aaron\_Rachlin@Praxair.com

**Contact:** Jeff Richards  
Wilmington, CA  
**Phone:** (310) 547-9445  
**Fax:** (310) 547-9545  
**E-mail:** Jeff\_Richards@Praxair.com

**Contact:** Ed Danieli Danbury, CT  
**Phone:** (203) 837-2112  
**Fax:** (203) 837-2540  
**E-mail:** Ed\_Danieli@Praxair.com

# **Quantum Fuel Systems Technologies Worldwide, Inc.**

**17872 Cartwright Road**

**Irvine, CA 92614**

**[www.qttww.com](http://www.qttww.com)**

**Products:** Quantum is a Tier One supplier to Original Equipment Manufacturers (OEMs) for engineered fuel delivery and fuel storage systems. Hydrogen, compressed natural gas (CNG) and liquid propane gas (LPG) handling and gaseous fuel storage system technologies are provided by Quantum to manufacturers of fuel cell engines and internal combustion engines.

**Contact:            Alan Niedzwiecki President and CEO**

**Phone                (949) 399-4500**

**Fax                    (949) 399-4600**

**E-mail:                [info@qttww.com](mailto:info@qttww.com)**

# Ricardo, Inc.

Detroit Technology Campus  
P.O. Box 22637  
40000 Ricardo Drive 93922-0637  
Van Buren Township, MI 48111



[www.ricardo.com](http://www.ricardo.com)

**Products:** Ricardo provides consulting engineering services and simulation software to the fuel cell vehicle industry. Specific services include: 1) complete powertrain and vehicle engineering, including systems integration, 2) fuel cell stack analysis, 3) transmission design, 4) electrical, electronic, and control systems development and supplier management, 5) vehicle simulation and testing, 6) fabrication and demonstration of prototype and limited-production vehicles, powertrain components, and vehicle systems, 7) project management, 8) development of strategic relationships with component suppliers, 9) validation, 10) benchmarking, and 11) integration of electrical devices to stack and driveline.

**Description:** Ricardo has been providing engineering services to the transportation and power generation industries since 1915. Ricardo's experience with fuel cells includes design reviews of mobile and stationary applications, EM and SOFC fuel cell stack performance models, water management and humidification, thermal management analysis and optimization, and Matlab-Simulink models.

<b>Contact:</b>	<b>James C. Paul, P.E.</b>	
<b>Phone:</b>	<b>Headquarters:</b>	<b>(734) 397-6666</b>
	<b>Western Region Office:</b>	<b>(831) 624-8700</b>
<b>Fax:</b>	<b>Headquarters:</b>	<b>(734) 397-6677</b>
	<b>Western Region Office:</b>	<b>(831) 624-8781</b>
<b>E-mail:</b>	<b>Headquarters:</b>	<b><a href="mailto:marc.wiseman@ricardo.com">marc.wiseman@ricardo.com</a></b>
	<b>Western Region Office:</b>	<b><a href="mailto:jim.paul@ricardo.com">jim.paul@ricardo.com</a></b>



## **RIX Industries**

**4900 Industrial Way  
Benicia, CA 94510**

**[www.rixindustries.com](http://www.rixindustries.com)**



**Products:** Oil-free high-pressure compressors for hydrogen product and low-pressure oil-less compressors for reformer feed.

**Description:** High-pressure compressors with extended distance pieces for guaranteed oil-free product gas. Slow speed units with excellent cooling for long life. Pressures up to 12,000 psig (830 barg). Low-pressure compressors are oil-less so no oil can possibly get into the gas stream. Crankcase is pressurized to prevent gas loss.

<b>Contact:</b>	<b>Dave Savidge</b>
<b>Phone:</b>	<b>(707) 747-5900 x 212</b>
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<b>E-mail:</b>	<b><a href="mailto:dsavidge@rixindustries.com">dsavidge@rixindustries.com</a></b>

# **RKI Instruments, Inc.**

**1855 Whipple Rd.  
Hayward, CA 94544**

**[www.rkiinstruments.com](http://www.rkiinstruments.com)**



**Products:** RKI Instruments, Inc. (RKI) is an innovative gas detection company located in Hayward, California. RKI is partnered with North American distributor for Riken Keiki Company, the world's leader in hydrogen gas detection and sensor technologies.

RKI specializes in hydrogen detection in the semiconductor and fuel cell industries. RKI's offering includes both stationary continuous monitors and handheld portable detectors. Many use innovative hydrogen sensing technologies that offer unsurpassed accuracy and specificity to hydrogen, and superior immunity to traditional catalyst poisons. Riken and RKI have provided many thousands of sensors to leading manufacturers of fuel cells and fuel cell vehicles, as well as to R&D facilities and infrastructure developers.

RKI's sensors have been proven to operate reliably in adverse conditions during extensive evaluations by leading fuel cell industry participants, including years of worry-free operation on pioneer fuel cell vehicles.

Who is RKI Instruments? RKI is gas detection for life.

**Contact:           Bruce Holcom**  
**Business Development Manager**  
**Phone:           (800)-754-5165**  
**Fax:              (510)-441-5650**

**San Diego Miramar College  
Advanced Transportation  
Technology Program**

**10440 Black Mountain Road  
San Diego, CA 92129**

**[www.transportationtech.com](http://www.transportationtech.com)**

**Products:** Technician Workforce Training / Industry Technical Assistance.

**Description:** as one of ten California Community College Advanced Transportation Technology Centers, San Diego Miramar College provides technician education and industry assistance on all alternative fuels and new technologies, including fuel cells. Working alone or in concert with other Centers technical training can be provided to ensure product operation is consistent with manufacturer specifications. In addition the Center will work with industry to plan for transportation fuel cell technology implementation to ensure it is undertaken with a specific and attainable end in mind.

<b>Contact:</b>	<b>Greg Newhouse</b>
<b>Phone:</b>	<b>(619) 388-7673</b>
<b>Fax:</b>	<b>(619) 388-7905</b>
<b>E-mail:</b>	<b><a href="mailto:gnewhous@sdccd.net">gnewhous@sdccd.net</a></b>

**Schatz Energy  
Research Center**  
Humboldt State University  
1 Harpst Street  
Arcata, CA 95521



[www.humboldt.edu/~serc](http://www.humboldt.edu/~serc)

**Products:** Fuel cell research and development, custom test stations for R&D and educational applications, control systems, integration, research

**Description:** At the Schatz Energy Research Center (SERC) on California's North Coast, we are working to establish clean and renewable energy technologies in our society. We design and build prototype proton exchange membrane (PEM) fuel cells and integrate them into complete power systems. We also provide energy education for K-12, undergraduate, and graduate students; business and service groups; and the general public, and we design and build PEM fuel cells for educational demonstrations and hands-on laboratory activities. As scientists and engineers, we are dedicated to our research. As teachers, we are passionate about educating people of all ages about the exciting potential of the hydrogen economy. Affiliated with Humboldt State University's Environmental Resources Engineering program, SERC provides a rare opportunity for undergraduate and graduate engineering students to acquire hands-on experience with cutting-edge energy technologies.

**Contact:** Peter Lehman, Director  
**Phone:** (707) 826.4345  
**Fax:** (707) 826.4347  
**E-mail:** [serc@humboldt.edu](mailto:serc@humboldt.edu)

# Siemens Westinghouse Power Corporation

310 Beulah Road  
Pittsburgh, PA 15235

The Siemens logo consists of the word "SIEMENS" in white, uppercase, sans-serif font, centered within a solid blue rectangular background.

[www.pg.siemens.com/en/fuelcells](http://www.pg.siemens.com/en/fuelcells)

**Products:** Pre-commercial prototypes of a 250 kW SOFC cogeneration system running on natural gas are available for demonstration, and for commercial delivery in 2006-2007. The system generates 250 kW AC electric power plus 150 kW of thermal energy as hot water, and includes all hardware, instrumentation and controls needed to interface with customer site boundaries. The electrical efficiency of the system is ~47% and the gas supply needed is 50 MCF/day (100 lb/h).

**Description:** Siemens Westinghouse is the leading developer of SOFCs with its proven tubular cell design, operated the longest running cell test of any type (~8 years), and demonstrated the largest SOFC power systems (250 kW), the longest running high temperature fuel cell (>20,000 hours with no cell degradation), and the world's first fuel cell/gas turbine hybrid (220kW). In 2003 its first commercial prototype SOFC, a 250 kW CHP system began operation in Toronto.

<b>Contact:</b>	<b>Chris Forbes</b>
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<b>E-mail:</b>	<b><a href="mailto:christian.forbes@siemens.com">christian.forbes@siemens.com</a></b>

# South Coast Air Quality Management District

21865 Copley Drive  
Diamond Bar, CA 91765

[www.aqmd.gov/tao](http://www.aqmd.gov/tao)



**Products:** Stationary fuel cell, mobile fuel cell, and hydrogen infrastructure research, development, and demonstration funding.

The AQMD is establishing a hydrogen infrastructure throughout the South Coast Air Basin to promote fuel cell vehicle and hydrogen internal combustion engine vehicle development and deployment. The AQMD is also funding the demonstration of residential and industrial, stationary fuel cells.

**Description:** The South Coast AQMD is the air pollution control agency for the four county region including Los Angeles and Orange counties and parts of Riverside and San Bernardino counties. This area spans approximately 11,000 square miles and is home to over 16 million residents. The AQMD is required by law to achieve and maintain healthful air quality for its residents. This is achieved through comprehensive planning, regulation, compliance assistance, enforcement, monitoring, technology advancement, and public education, as well as working closely with the state Air Resources Board.

<b>Contact:</b>	<b>Matt Miyasato, Ph.D.</b>
	<b>Technology Demonstrations Manager</b>
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# **Spencer Management Associates**

**545 Buttonwood Dr.  
Danville, CA 94506**

**[www.washom.com](http://www.washom.com)**

**Description:** As part of its on-going engagement in due diligence and investment analysis the firm has had a prominent position in the distributed generation and fuel cell technology areas. The firm has an unequaled perspective of global issues and opportunities by concurrently serving as a strategic advisor on the development and commercialization of fuel cell technologies to the US DOE (DOE-NETL), the International Finance Corporation of the World Bank Group (IFC Env Projects) and the International Energy Agency (IEA). Spencer Management Associates unparalleled eleven fuel cell due diligence evaluations positioned Mr. Washom to serve as the industrial stakeholder coordinator at the Next Generation Fuel Cell Workshop sponsored by DOE-FETC in November 1998. In 2003, the firm conducted for USDOE due diligences on each of the four Industrial Team Leaders in the \$500M industry cost shared Solid State Energy Conversion Alliance fuel cell program (SECA).

**Contact:                    Spencer Washom**  
**Phone:                     (925) 964-0500**

# State of California Air Resources Board

1001 I Street  
Sacramento, CA 95814

California Environmental Protection Agency



[www.arb.ca.gov](http://www.arb.ca.gov)

**Description:** The California Air Resources Board (ARB) is a part of the California Environmental Protection Agency. ARB's principal mission is to improve air quality in order to protect the health of California's citizens, especially that of our susceptible populations such as children and the elderly.

The Agency was established in 1967 and is charged with improving the air quality in California to meet federal standards by the year 2010 and to continue this effort until the air quality meets California's even more protective standards. Our regulatory authority extends to setting standards for emissions sources and fuel specification.

ARB is working to implement hydrogen and fuel cells into California in two ways—regulations and partnerships. Presently, California has fuel cell vehicle requirements incorporated into the Zero Emission Vehicle and Zero Emission Bus regulations.

We are also charter members of two public-private groups, the California Fuel Cell Partnership and the California Stationary Fuel Cell Collaborative. ARB is also working to advance Governor Schwarzenegger's goal to make hydrogen stations available to the majority of Californians by 2010.

<b>Contact:</b>	<b>Alan C. Lloyd, Chair</b>
<b>Phone:</b>	<b>(916) 322-5840</b>
<b>Fax:</b>	<b>(916) 327-5748</b>
<b>E-mail:</b>	<b><a href="mailto:alloyd@arb.ca.gov">alloyd@arb.ca.gov</a></b>



# **State of California Business, Transportation and Housing Agency**

**980 9<sup>th</sup> Street, Suite 2450  
Sacramento, CA 95812**

**[www.bth.ca.gov](http://www.bth.ca.gov)**

**Description:** Policy development for the governor on housing regulation, transportation projects and finance, and local housing development. Oversight of 14 departments and commissions, including Caltrans, California Highway Patrol, Department of Motor Vehicles and the New Motor Vehicle Board.

The Business, Transportation and Housing Agency is a core group member of the California Stationary Fuel Cell Collaborative.

<b>Contact:</b>	<b>Secretary - Sunne Wright McPeak</b>
<b>Phone:</b>	<b>(916) 323-5400</b>
<b>Fax:</b>	<b>(916) 327-0051</b>

# State of California

## Department of General Services

707 3<sup>rd</sup> Street

West Sacramento, CA 95605

[www.dgs.ca.gov](http://www.dgs.ca.gov)

**Services:** The Department of General Services (DGS) is the state's business agent, providing a wide range of business services to its clients, who are public agencies. There are over 20 major areas of business services provided, ranging from insurance and risk management to printing to dispute resolution. Of greatest relevance to this directory are the Procurement Division, the Office of Fleet Administration, and the Real Estate Services Division.

**Description:** DGS is a department of the government of the State of California, in the State and Consumer Services Agency. Services related or potentially related to fuel cells include: property acquisition, project development, project financing, purchasing, project accounting, design, construction, ownership, operation, maintenance, automotive fleet operation and maintenance, and ongoing contract administration.

<b>Contact:</b>	<b>Doug Grandy</b> <b>Chief Energy Policy Advisor</b>
<b>Phone:</b>	<b>(916) 375-4403</b>
<b>Fax:</b>	<b>(916) 375-4490</b>
<b>E-mail:</b>	<b><a href="mailto:doug.grandy@dgs.ca.gov">doug.grandy@dgs.ca.gov</a></b>

## SunLine Transit Agency

32-505 Harry Oliver Trail  
Thousand Palms, CA 92276



[www.sunline.org](http://www.sunline.org)

**Products:** Hydrogen generation, storage and dispensing facility open to the public. Dispensing at 3000, 3600 & 5000 psi. CNG, LNG and HCNG also available.

**Description:** In 1994 SunLine became the first transit agency in the world to park all its diesel buses and switch overnight to a fleet powered 100% by clean-burning compressed natural gas (CNG). From natural gas, SunLine expanded into hydrogen and in April 2000 opened the first American facility to generate hydrogen from renewable sources and use it in zero-emission, fuel cell vehicles and stationary fuel cell applications.

SunLine is an associate member of the California Fuel Cell Partnership, and frequently serves as a demonstration site for advanced alternative fuel transportation technologies.

**Contact:** Gayl Biondi, Director, Business Development  
**Phone:** (760) 343-3456  
**Fax:** (760) 343-4147  
**E-mail:** [gbiondi@sunline.org](mailto:gbiondi@sunline.org)

**Contact:** Bert Kronmiller  
**Marketing Coordinator/Alternative Fuel Projects**  
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**Fax:** (760) 343-4147  
**E-mail:** [kronmiller@sunline.org](mailto:kronmiller@sunline.org)

# Teledyne Energy Systems, Inc.

10707 Gilroy Road  
Hunt Valley, MD 21031-1311



[www.teledynees.com](http://www.teledynees.com)

**Products:** Teledyne Energy Systems (TESI) is a global leader providing on-site hydrogen/oxygen gas and power generation, fuel cell test systems, and engineering services based on proprietary electrolysis, fuel cell, and thermoelectric technologies.

**Description:** MEDUSA™ fuel cell test stations provide an easy-to-use turnkey solution for testing fuel cell components and stacks. Our test stations provide a Windows® based interface enabling the user to begin immediate testing. Based on our state-of-the-art FC test stations, TESI provides comprehensive and custom engineered fuel cell testing services for fuel cells up to 10 kW. Teledyne produces Perry™ PEM fuel cell stacks and systems offering proven modular technology for companies designing fuel cell power systems operating on hydrogen or reformed fuels for stationary and mobile applications. As one of the world's largest suppliers of on-site hydrogen gas generators, TITAN™ water electrolysis products meet a wide range of customer needs providing high-purity hydrogen and oxygen at usable pressures.

**Contact:** Dawn McNeil  
**Manager Fuel Cell Products**  
**Phone:** (410) 891-2226  
**Fax:** (410) 771-8618  
**E-mail:** Dawn.McNeil@teledynees.com

# TIAX LLC

Cambridge Headquarters  
15 Acorn Park  
Cambridge, MA  
02140-2328



West Coast Office  
1601 S. De Anza Boulevard Suite 100  
Cupertino, CA 95014-5363 / 408-517-1550

[www.tiax.biz](http://www.tiax.biz)

**Products/Services:** TIAX is a leading consulting firm and resource in FC technologies, markets and systems. We help clients develop, demonstrate, assess, and commercialize FC systems and components. We pioneered work in fuel processing technologies in the 1990s, and have developed detailed system designs for PEMFC, SOFC, and DMFC. Our conceptual design involves component sizing using our proprietary thermodynamic system models, component design based on detailed engineering. We provide ongoing technical support for the California Fuel Cell Partnership and the California Stationary Fuel Cell Collaborative. We perform emissions testing on FC reformers and assess life-cycle emissions for FC systems.

**Contact:** Brian Barnett, Ph.d.  
**Phone:** (617) 498-5307  
**Fax:** (617) 498-7012 (MA office)  
**E-mail:** [barnett.b@tiax.biz](mailto:barnett.b@tiax.biz)

**Contact:** Peter Teagan, Ph.D.  
**Phone:** (617) 498-6054  
**Fax:** (617) 498-7054  
**E-mail:** [teagan.peter@tiax.biz](mailto:teagan.peter@tiax.biz)

**Contact:** Stefan Unnasch  
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# **Toyota Motor Sales USA, Inc.**

**19001 South Western Avenue  
Torrance, CA 90509**



**[www.toyota.com](http://www.toyota.com)**

**Products:** Toyota Motor Sales, USA, Inc. (TMS) is the North American sales headquarters for Toyota Motor Corporation, which is primarily engaged in the design, manufacture, assembly and sale of passenger cars, recreational and sport-utility vehicles (SUVs), minivans, trucks and related parts and accessories worldwide.

Comprehensive development for Toyota's Fuel Cell Hydrogen Vehicle (FCHV) began in 1992 – from materials, components and systems to control and production technology. In 2002, TMS began limited marketing with the delivery of 2 Toyota FCHVs in the U.S. to the University of California, Irvine and Davis campuses, making the company the first OEM to commercially lease fuel cell vehicles in the United States.

Today, Toyota continues to pursue the realization of a hydrogen community, from continued research on fuel cell technology to investigating hydrogen manufacturing and distribution.

**Contact:** **Bill Reinert**  
**National Manager, Advanced Technologies**  
**Phone:** **(310) 468-4047**

**University of California, Berkeley**  
**Center for Interdisciplinary**  
**Distributed Energy Research -**  
**Energy and Resources Group**

**University of California**  
**2105 Bancroft Way, Suite 300**  
**Berkeley, CA 94720-1516**

**<http://ist-socrates.berkeley.edu/~rael/CIDER.htm>**

**Products:** Research Description: Technical, economic, and environmental research and analysis of fuel cell systems for stationary power applications

<b>Contact:</b>	<b>Dr. Timothy Lipman - Executive Director</b>
<b>Phone:</b>	<b>(510) 642-4501</b>
<b>Fax:</b>	<b>(510) 642-0910</b>
<b>E-mail:</b>	<b><a href="mailto:telipman@socrates.berkeley.edu">telipman@socrates.berkeley.edu</a></b>

**University of California  
UC Davis  
Institute of  
Transportation Studies**



**Academic Surge, Rm. 2028  
One Shields Avenue  
Davis, CA 95616**

**[www.its.ucdavis.edu](http://www.its.ucdavis.edu)  
[www.its.ucdavis.edu/hydrogen](http://www.its.ucdavis.edu/hydrogen)**

**Description:** In 1991, the Institute of Transportation Studies at UC Davis became an official organized research unit. Since then, ITS-Davis has evolved into a multifaceted internationally recognized program with 50 affiliated faculty members and more than 70 graduate students. It receives funding from government, private industry, foundations, and a variety of prestigious academic and research institutions — all of which have watched the Institute grow into one of the world's leading university programs on travel behavior, advanced environmental vehicle technology, and environmental impacts of transportation.

The following are examples of the Institute's research in the area of hydrogen and fuel cells:

- Hydrogen Infrastructure Planning and Development
- H2/CNG and Fuel Cell Bus Evaluations
- Fuel Cells to Reduce Diesel Emissions
- Advanced Vehicle Modeling
- Advanced Vehicle Powersystem Evaluations
- Hydrogen Production and Utilization Laboratory

**Contact:           Dr. Daniel Sperling  
                          Professor and Director  
                          Institute of Transportation Studies**

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Fax:                  (530) 752-6572  
E-mail:              dsperling@ucdavis.edu**



# University of California, Berkeley

## The Energy and Resources Group

310 Barrows Hall  
University of California  
Berkeley, CA, 94720-3050

<http://socrates.berkeley.edu/erg>  
<http://socrates.berkeley.edu/~rael>

**Products:** The Energy and Resources Group (ERG) at UC Berkeley conducts research programs and public outreach efforts on the technical and economic potential of fuel cell systems and other distributed energy resources, and on the economics and environmental impacts of hydrogen production, delivery, and end-use.

**Description:** ERG is an interdisciplinary unit on the UC Berkeley campus for energy and environmental science, technology, and policy research, and with a history going back 30 years, ERG's research in the area of fuel cells and hydrogen energy span several different topic areas and research disciplines. Currently active research areas include those on:

- fuel cell system current and potential future technical performance;
- fuel cell system manufacturing cost and potential for cost reduction;
- assessments of hydrogen fuel production and delivery;
- analysis of combined heat and power (CHP) systems based hydrogen and other fuels;
- air pollutant and greenhouse gas emissions from hydrogen-based and other distributed energy resources; and
- the potential integration of fuel cells and hydrogen with renewable energy resources.

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**Contact:** Tim Lipman, Asst. Research Scientist  
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**E-mail:** [telipman@socrates.berkeley.edu](mailto:telipman@socrates.berkeley.edu)

**University of California**  
**Lawrence Berkeley National Laboratory**  
**One Cyclotron Road**  
**Berkeley, CA 94720**

**Website:** [www.lbl.gov](http://www.lbl.gov)

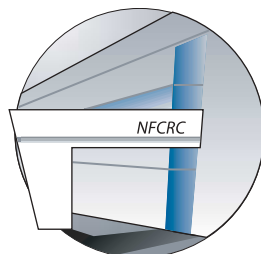
Description: Fuel Cell research and development including  
electrocatalysis, fuel cell modeling, and operation of lab-scale cells

**Contact:** Elton J. Cairns  
**Phone:** (510) 486-5028  
**Fax:** (510) 486-7303  
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# University of California, Irvine National Fuel Cell Research Center (NFCRC)

University of California  
Irvine, CA 92697-3550

[www.nfcrc.uci.edu](http://www.nfcrc.uci.edu)



**National Fuel Cell  
Research Center**

**Products:** The mission of the NFCRC is

(1) to facilitate and to accelerate the development and deployment of fuel cell technology and fuel cell systems, and (2) to promote strategic alliances that address the market challenges associated with the installation and integration of fuel cell systems into the built environment.

**Description:** The NFCRC was dedicated in 1998 by the U.S. Department of Energy (DOE) and the California Energy Commission (CEC) with the goal to advance fuel cell technology and the fuel cell market through basic and applied research founded on fundamental studies and the beta testing of prototypes, as well as pre-commercial and early commercial products.

The NFCRC facilitates partnerships and collaborations between industry and the university, and provides a bridge to the world marketplace and new avenues for developing and applying fuel cell technologies.

The NFCRC also offers vital educational opportunities for the general public, industry, undergraduate and graduate students, along with programs extending to grades K-12, and hosts the “Universities for Fuel Cells” initiative in collaboration with the U.S. Department of Defense and the DOE.

The NFCRC is equipped with five indoor test cell sites and an outdoor testing platform allocated for the testing and research of grid-connected prototype and pre-commercial fuel cells (e.g., 0.5 to 1,000 kilowatts). The operation of larger units (e.g., 1 to 10 megawatt) occur at “Field Sites” located at the Central Plant (Institutional Field Site), University Research Park (Power Park Field Site), and various business and utility sites (e.g., waste-water treatment plants) in the region.

<b>Contact:</b>	<b>Professor Scott Samuelson, Director</b>
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<b>E-mail:</b>	<b><a href="mailto:gss@nfcrc.uci.edu">gss@nfcrc.uci.edu</a></b>

# US Fuel Cell Council

1625 K Street, NW, Suite 725  
Washington, DC 20006



[www.usfcc.com](http://www.usfcc.com)

**Products:** Industry surveys, testing protocols, industry reports, glossary of fuel cell terms, fact sheets, informational brochures, Media Guide, monthly and quarterly newsletters, web site, annual Congressional Fuel Cell Exposition.

**Description:** Formed in 1998, the USFCC is the trade association of the fuel cell industry. Our membership includes producers of all types of fuel cells, major suppliers, automaker and their suppliers, universities, fuel cell customers, hydrogen and other energy providers, government agencies, and many others.

**Contact:** Robert Rose, Executive Director  
**Phone:** (202) 293-5500  
**Fax:** (202) 785-4313  
**E-mail:** [brose@usfcc.com](mailto:brose@usfcc.com)

# UTC Fuel Cells

195 Governor's Highway  
South Windsor, Conn. 06074



[www.utcfuelcells.com](http://www.utcfuelcells.com)

**Products:** Fuel cell power plants for space, stationary and transportation applications

**Description:** UTC Fuel Cells designs, develops and manufactures fuel cells in a range of technologies for a number of applications.

UTC Fuel Cells has provided fuel cells, based on alkaline technology, to power every U.S. manned space flight since Apollo, continuing today with the Space Shuttle program. Since 1991, it has manufactured and sold the PureCell™200 (formerly known as the PC25), a 200-kilowatt fuel cell power plant based on phosphoric acid technology and has delivered more than 255 units to customers in 19 countries on five continents.

UTC Fuel Cells also designs and develops PEM-based fuel cells for automotive and fleet applications working with automakers Nissan, Hyundai, BMW and with bus manufacturers Thor Industries of the U.S. and Irisbus of Italy. UTC Fuel Cells uses a proprietary ambient-pressure approach to fuel cell design allows for a quieter, smaller, and more efficient fuel cell system that is easier to install in a vehicle.

UTC is a member of the California Fuel Cell Partnership. Nissan and Hyundai are Partnership members operating UTC Fuel Cell equipped cars in California.

UTC Fuel Cells is part of the UTC Power unit of United Technologies Corp. (NYSE: UTX), a \$28 billion diversified manufacturer of building systems and aerospace products.

<b>Contact:</b>	<b>Peter Dalpe</b>
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<b>E-mail:</b>	<b>Peter.Dalpe@UTCFuelCells.com</b>

# Valley Environmental Associates

5499 Paseo Gilberto

Yorba Linda, CA. 92886

**Products:** Categories include hydrogen, hydrogen refueling stations, hydrogen energy stations, electrolyzers, fuel cells, hydrogen storage, emission control systems, air quality issues and related issues.

**Description:** New business development, strategic planning activities, applications of new energy technologies, government interfacing, and related activities.

<b>Contact:</b>	<b>Henry W. (Hank) Wedaa</b>
<b>Phone:</b>	<b>(714) 779-1604</b>
<b>Fax:</b>	<b>(714) 693-0588</b>
<b>E-mail:</b>	<b>hwedaa@adelphia.net</b>

# Ztek Corporation

300 West Cummings Park  
Woburn, MA 01801



[www.ztekcorporation.com](http://www.ztekcorporation.com)

**Products:** Fuel Cell and Hydrogen Reformer Systems DG 25E and 200E for Distributed Generation Applications Zero Emission Station (ZES) 600H and 4000H for Hydrogen Reforming Applications High Efficiency Co-Production System (HECP).

**Descriptions:** DG 25E and 200E Ztek Corporation is developing solid oxide fuel cell (SOFC) systems for distributed electrical generation applications with or without the capability to provide heating and air conditioning. Both provide low-cost, clean and efficient energy production. The DG 25E offers 25kW of electrical output and fits in a 6' by 6' by 6' space. The DG 200E combines a SOFC with a gas turbine for increased efficiency.

ZES 600H and 4000H, Ztek's commercial hydrogen reformers will convert gasoline, natural gas or methanol to hydrogen at 85% efficiency. ZES 600H will produce 600 standard cubic feet per hour (scfh) of hydrogen while ZES 4000H will produce 4000 scfh per hour. Each model will fit in a 10' by 10' by 10' space, allowing easy integration into existing gasoline fueling stations.

HECP, Ztek's HECP system is available in two models. The first will produce 300 scfh of hydrogen per hour with 10kW of electricity. The second will produce 2000 scfh per hour with 75kW of electricity. Each model is highly integrated, fully balanced and optimally efficient in design and construction.

<b>Contact:</b>	<b>Robb Edwards</b>
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